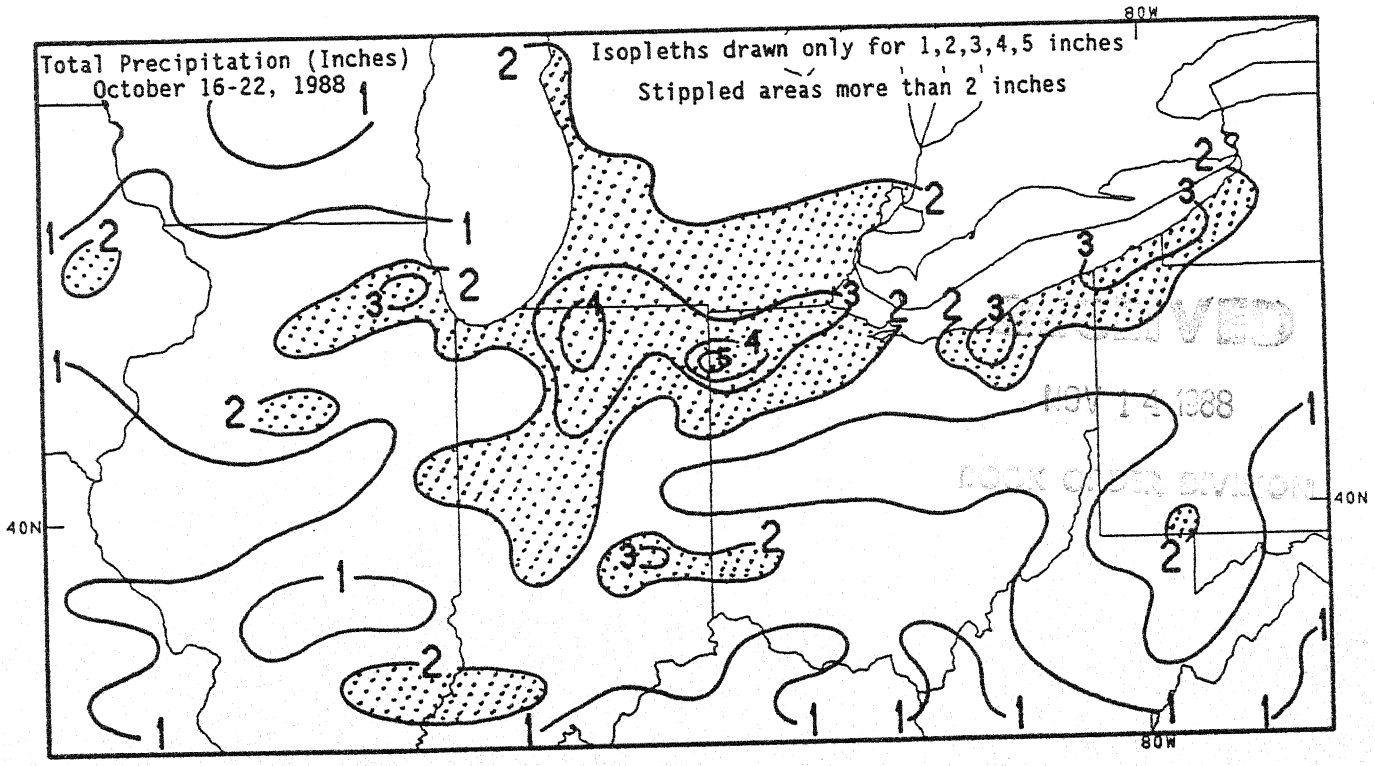
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 88/43 WASHINGTON, DC OCTOBER 22, 1988



STRONG THUNDERSTORMS BROUGHT HEAVY RAINS TO PORTIONS OF THE GREAT LAKES AND OHIO VALLEY, FURTHER EASING PRECIPITATION DEFICITS ACCUMULATED SINCE THIS SPRING. FARTHER EAST, MODERATE TO HEAVY PRECIPITATION FELL ON NEW ENGLAND AND THE MID-ATLANTIC STATES, PROVIDING SOME RELIEF TO LONG-TERM DRYNESS IN THE LATTER AREA.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

Highlights of major global climatic events and anomalies.
U.S. climatic conditions for the previous week.
U.S. apparent temperatures (summer) or wind chill (winter).
Global two-week temperature anomalies.
Global four-week precipitation anomalies.
Global monthly temperature and precipitation anomalies.
Global three-month precipitation anomalies (once a month).
Global twelve-month precipitation anomalies (every 3 months).
Global temperature anomalies for winter and summer seasons.
Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF OCTOBER 22, 1988
(Approximate duration of anomalies is in brackets.)

1. North Central United States:
AREA ENTERS DRY SEASON.
A large precipitation deficit remained as the dry season began. See U.S. Weekly Weather Highlights [Discontinued at 32 weeks].

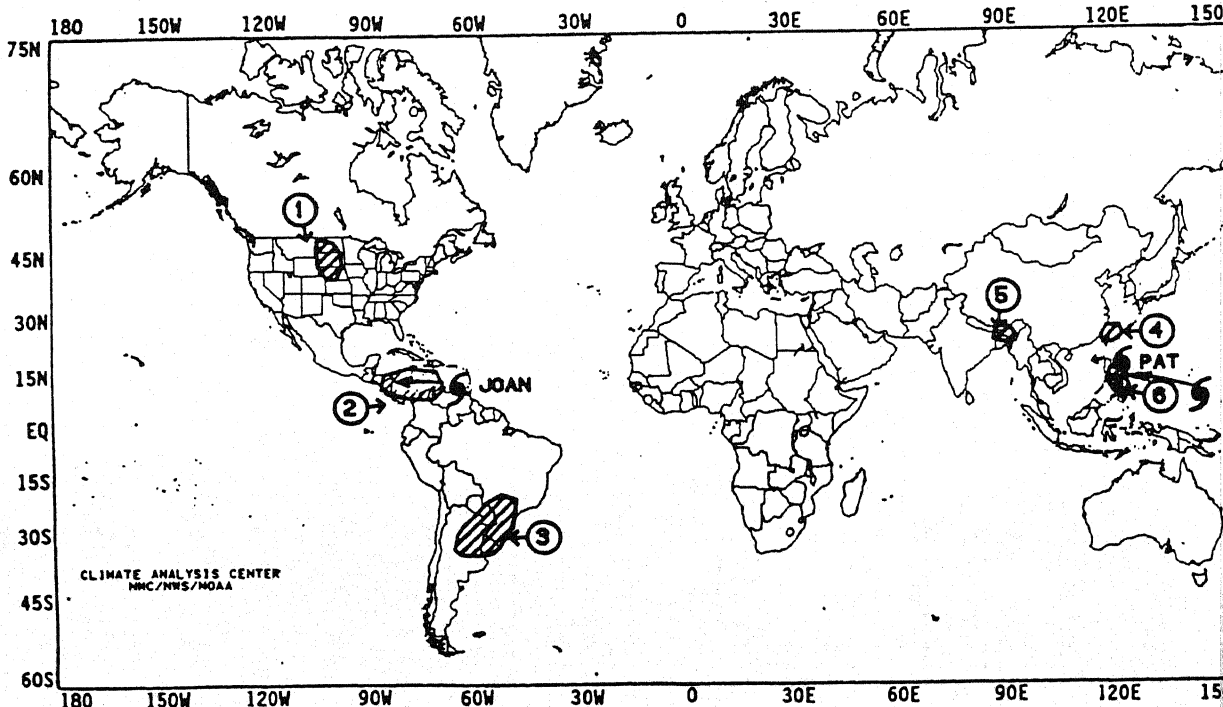
2. Colombia, Venezuela, and Central America:
HURRICANE JOAN POUNDS REGION.
Heavy precipitation, as much as 198.4 mm (7.81 inches), was reported as Hurricane Joan battered the northern parts of Colombia and Venezuela Monday (Oct. 17) and Nicaragua on Saturday (Oct. 22) [Episodic Event].

3. Central South America:
BELOW NORMAL PRECIPITATION PERSISTS.
Less than 38.5 mm (1.52 inches) of precipitation was reported in southern Brazil, Paraguay, Uruguay, and parts of northeastern Argentina. See Special Climate Summary [17 weeks].

4. Taiwan:
ABNORMALLY WET CONDITIONS END.
Most stations recorded less than 26.5 m
inches) of rain; however, isolated statio
the eastern coast had up to 113 mm (4.45
of precipitation [Ended at 11 weeks].

5. Bangladesh:
CYCLONE STRIKES COUNTRY.
Torrential downpours and high winds
tropical cyclone lashed southern Bangl
Wednesday (Oct. 19) [Episodic Event].

6. Philippines:
TWO TYPHOONS IN ONE WEEK.
Typhoons Pat and Ruby swept across the Ph
with as much as 209.9 mm (8.26 inc
precipitation reported [Episodic Events].



Approximate locations of the major anomalies and events described above are shown on this map. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, longer term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

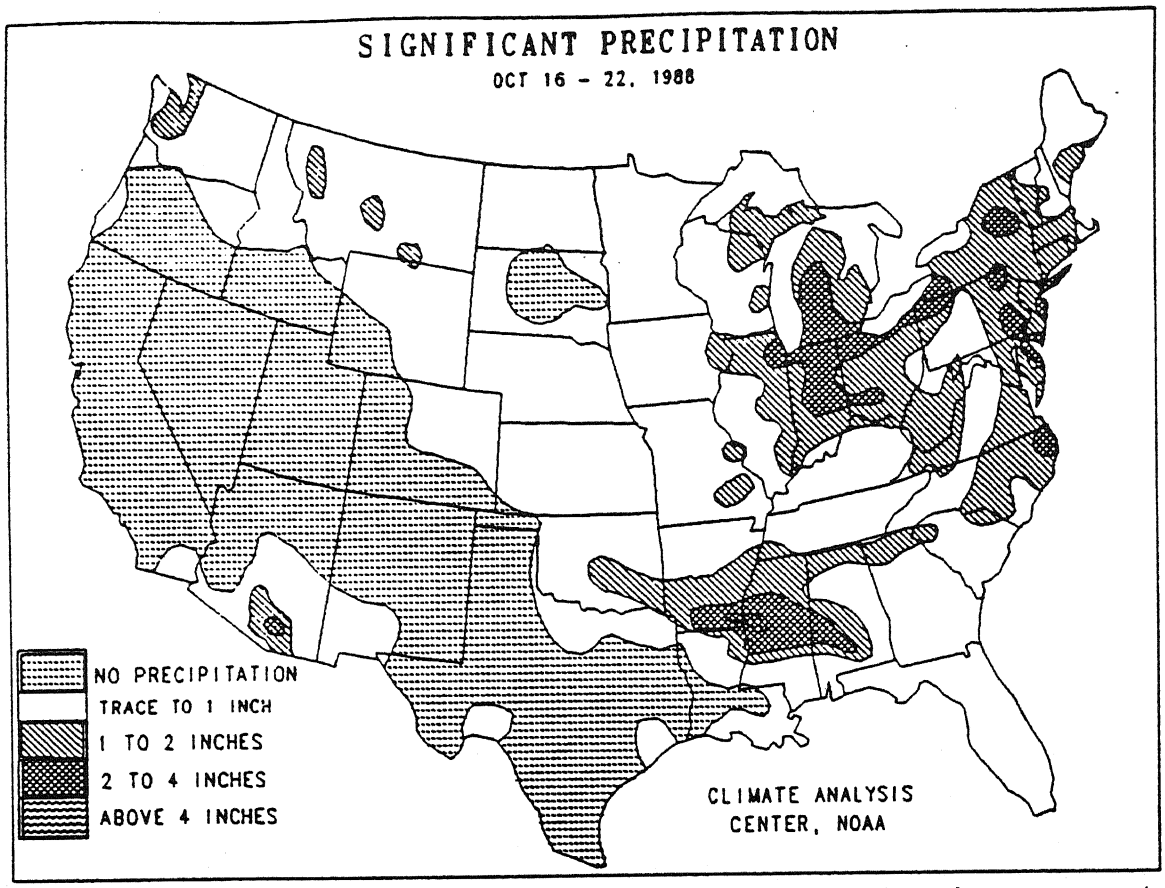
FOR THE WEEK OF OCTOBER 16 THROUGH OCTOBER 22, 1988.

In sharp contrast to the dry weather experienced throughout most of the eastern half of the U.S. during the first two weeks of October, much of the area received moderate to heavy precipitation last week. Strong thunderstorms preceding a cold front produced torrential downpours and hail in the Great Lakes and Ohio Valley as several stations in Indiana, Michigan, and Ohio recorded between 2 and 5 inches of rain, according to the River Forecast Centers (see front cover and Table 1). Farther south, a developing low pressure center triggered heavy showers and thunderstorms (between 2 and 5 inches) in southern Arkansas and central Mississippi early in the week. As the week progressed, the system intensified and moved up the Atlantic Coast, bringing moderate to heavy precipitation to much of the mid-Atlantic and New England, including up to 10 inches of snow in the higher elevations of New York, Vermont, and New Hampshire. Elsewhere, moderate to heavy precipitation fell in portions of the northern Cascades, southern Arizona, and southeastern Alaska. Light to moderate amounts were measured along the Pacific Northwest Coast, in parts of the Southwest, the northern Rockies, and throughout most of the eastern half of the nation with the exception of the extreme southern and southeastern U.S. Little or no precipitation occurred in most of the West, from central Washington southward to California and eastward to Colorado and New Mexico, in the middle Missouri Valley, the central and southern Great Plains, and along the Gulf Coast.

For the third consecutive week, warmer weather persisted in the West while below normal temperatures were observed in the East. During the week, temperatures averaged between 7° and 10°F above normal throughout most of the southern two-thirds of the Pacific Coast, Intermountain Region, and Rocky Mountain states, as well as much of central and southern Texas (see Table 2). More than 45 stations in the West tied or set daily record highs during the week. Readings in the nineties were found in interior California, southern Arizona, southeastern New Mexico, and throughout most of Texas. Slightly above normal temperatures were reported in the Pacific Northwest, the northern third of the Rockies, the northern half of the Great Plains, and along the Gulf Coast. Weekly temperatures in the eastern half of the U.S. moderated from the previous two weeks but still remained below normal. Greatest negative departures (between -4° and -5°F) occurred in the upper Midwest, the central Appalachians, and in parts of the Carolinas (see Table 3). Lows dipped below freezing across a majority of the north-central and northeastern United States, while readings in the teens were limited to northern Minnesota and sections of the northern Appalachians (see Figure 1). Bitterly cold Arctic air and sub-zero readings resulted in weekly temperature averages as much as 18°F below normal in northern and central Alaska.

TABLE 1. Selected stations with more than one and three-quarters of an inch of precipitation for the week.

Station	Amount(In)	Station	Amount(In)
South Bend, IN	4.06	Mt. Clements/Selfridge AFB, MI	2.14
Chicago/O'Hare, IL	3.77	New York/Kennedy, NY	2.06
Toledo, OH	3.70	Meridian, MS	2.05
Erie, PA	3.38	Utica, NY	2.04
Meridian NAS, MS	3.22	Findlay, OH	2.01
Mt. Washington, NH	2.80	Jackson, MS	2.01
Greenwood, MS	2.68	Wrightstown/McGuire AFB, NJ	1.90
Dover AFB, DE	2.42	Houghton Lake, MI	1.89
Indianapolis, IN	2.33	Detroit, MI	1.88
Tucson/Davis-Monthan AFB, AZ	2.31	Syracuse, NY	1.86
Portland, ME	2.29	Dayton, OH	1.84
Grand Rapids, MI	2.23	Bluefield, WV	1.83
Lafayette, IN	2.19	New York/La Guardia, NY	1.82
Muskegon, MI	2.19	Bridgeport, CT	1.77
Peru/Grissom AFB, IN	2.15		



NOTE: The Weekly Weather Features chart has been replaced with two separate weekly charts, the Significant Precipitation and Departure of Average Temperature from Normal. This will provide better clarification of climate anomalies to the reader, especially in areas with multiple anomalies.

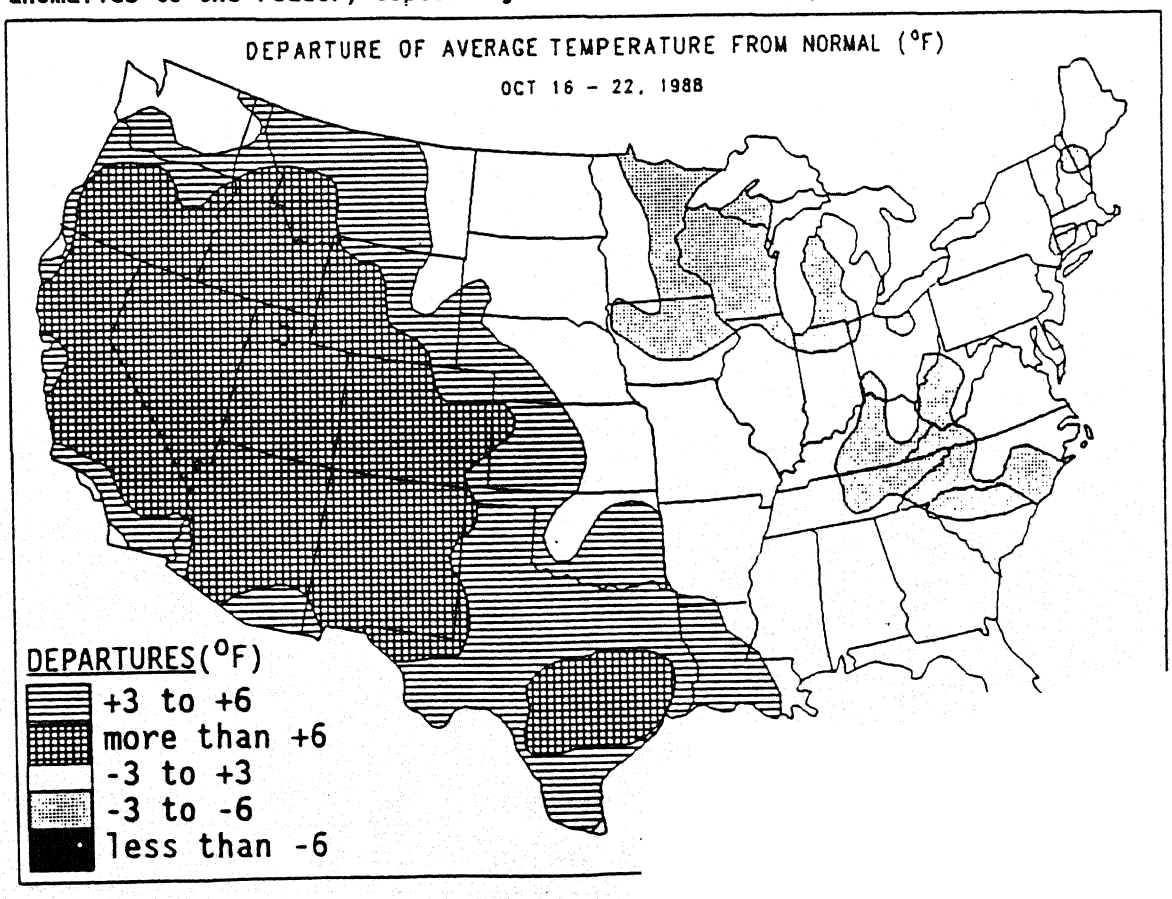
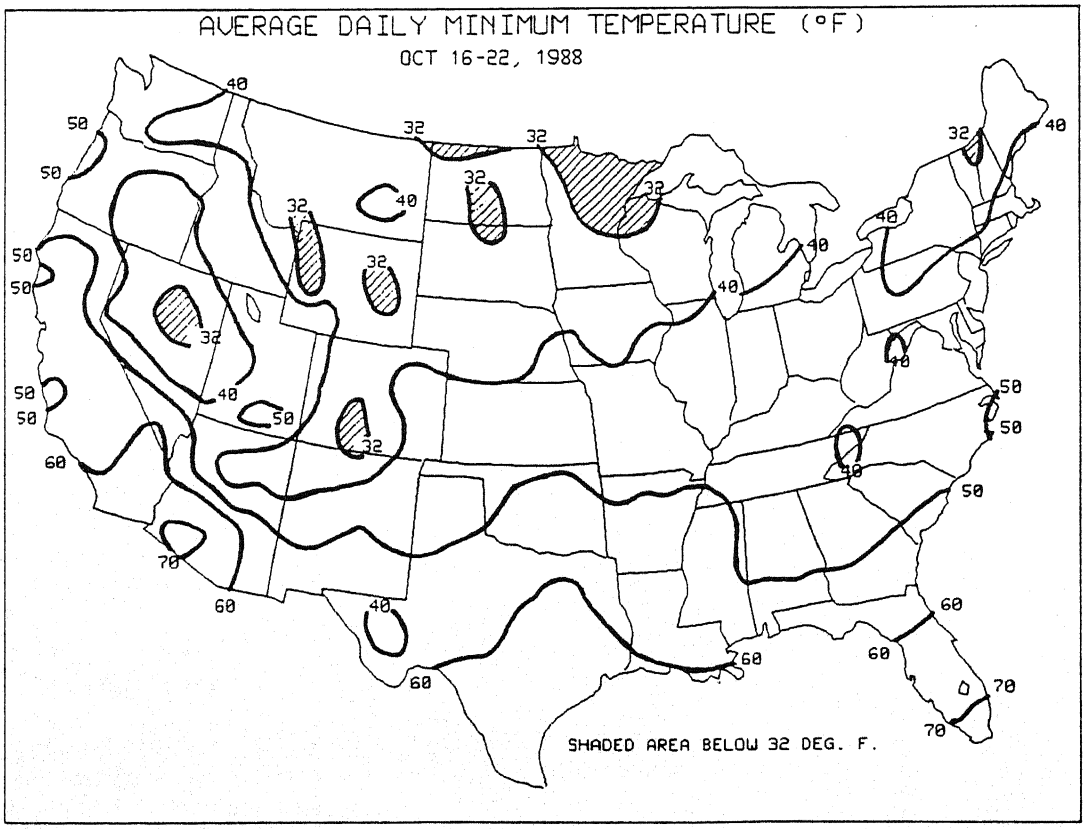


TABLE 2. Selected stations with temperatures averaging greater than 7°F ABOVE normal for the week.

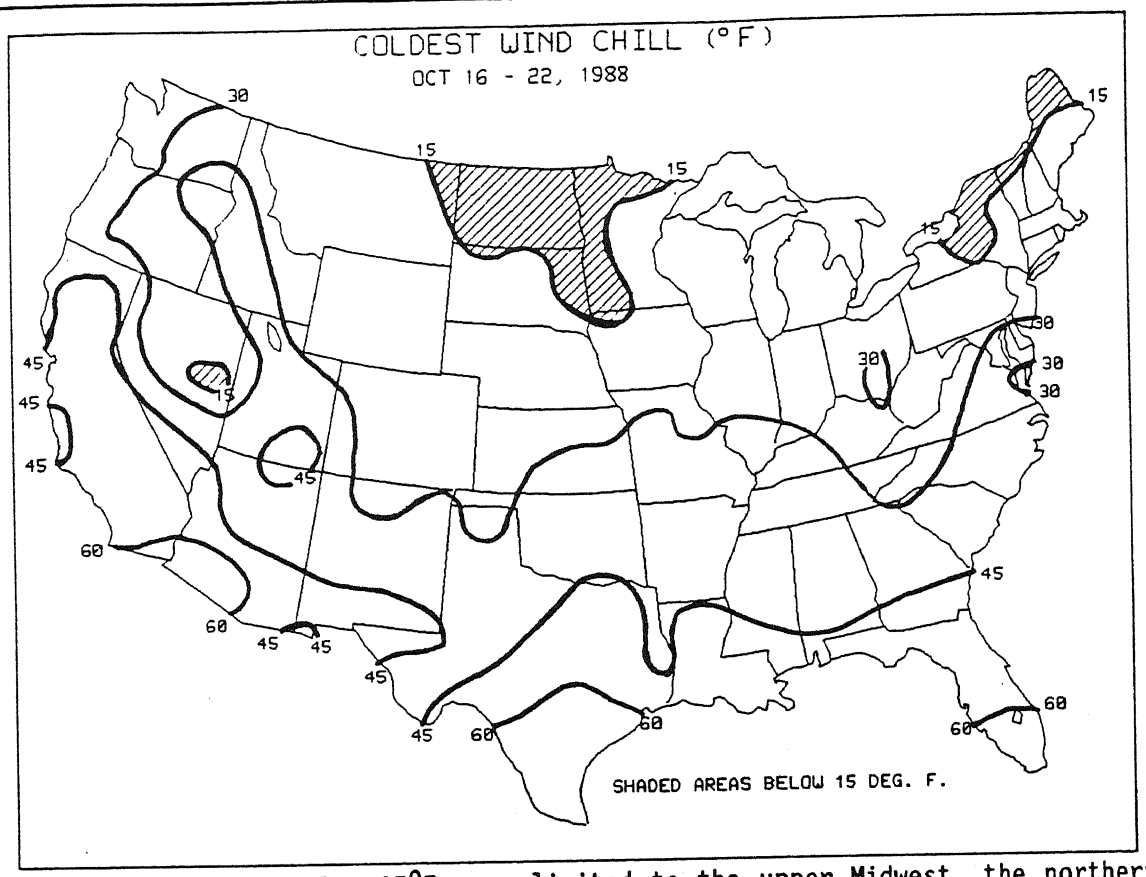
Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Rock Springs/Sweetwater,WY	+11	54	Redmond, OR	+9	56
Phoenix, AZ	+10	82	San Antonio, TX	+8	77
Daggett, CA	+10	77	Glendale/Luke AFB, AZ	+8	77
Reno, NV	+10	59	Austin, TX	+8	76
Burley, ID	+10	57	Las Vegas, NV	+8	74
Idaho Falls, ID	+10	54	Sacramento, CA	+8	71
Redding, CA	+ 9	74	Trinidad, CO	+8	60
Fresno, CA	+ 9	72	Salt Lake City, UT	+8	59
Paso Robles, CA	+ 9	70	Boise, ID	+8	58
Roswell, NM	+ 9	67	Cedar City, UT	+8	58
Prescott, AZ	+ 9	63	Colorado Springs, CO	+8	57
Medford, OR	+ 9	62	Lander, WY	+8	53
Pocatello, ID	+ 9	56			

TABLE 3. Selected stations with temperatures averaging greater than 4°F BELOW normal for the week.

Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Barrow, AK	-18	-6	Warroad, MN	-5	37
Bettles, AK	-12	5	Marquette, MI	-5	38
Fairbanks, AK	-10	12	Duluth, MN	-5	38
Big Delta, AK	-10	13	Park Falls, WI	-5	39
Barter Island, AK	- 9	5	Rochester, MN	-5	42
Northway, AK	- 7	11	Grand Rapids, MI	-5	45
Gulkana, AK	- 7	18	Asheville, NC	-5	50
Kotzebue, AK	- 5	16	Bristol, TN	-5	51
International Falls, MN	- 5	37			



Lows averaged below 32°F for the week in portions of the Rockies, upper Midwest, northern Great Plains, and Great Basin, and in the mid to upper thirties throughout New England, the Rockies, and the north-central U.S.



Extreme wind chills below 15°F were limited to the upper Midwest, the northern Great Plains, and western New England as colder weather covered the area late in the week (top); similar to the past two weeks, readings fell below freezing across much of the north-central and northeastern United States (bottom).

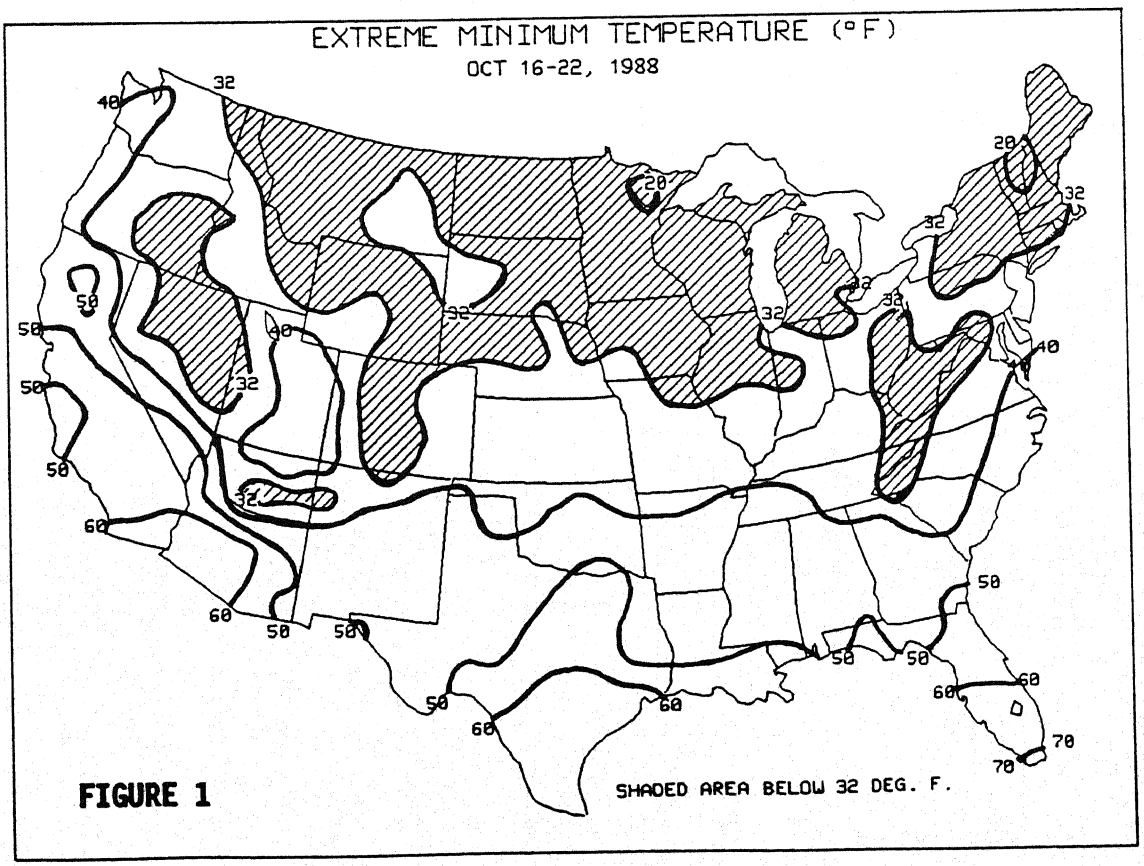
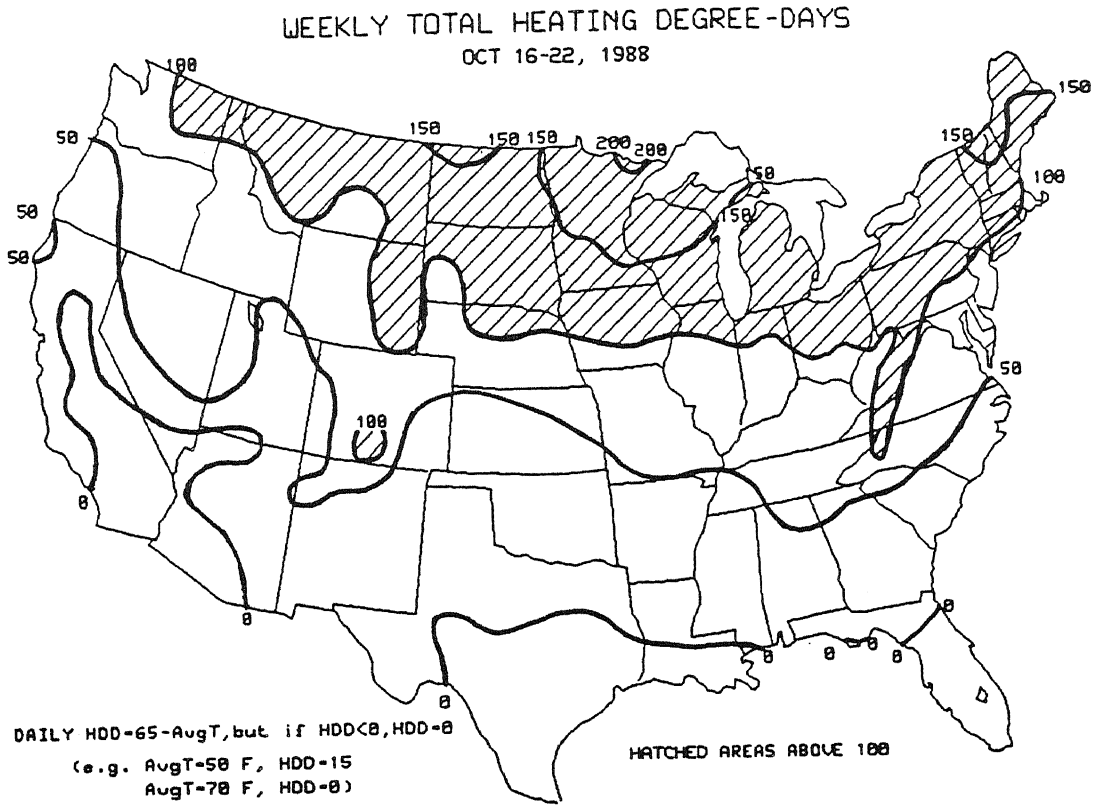
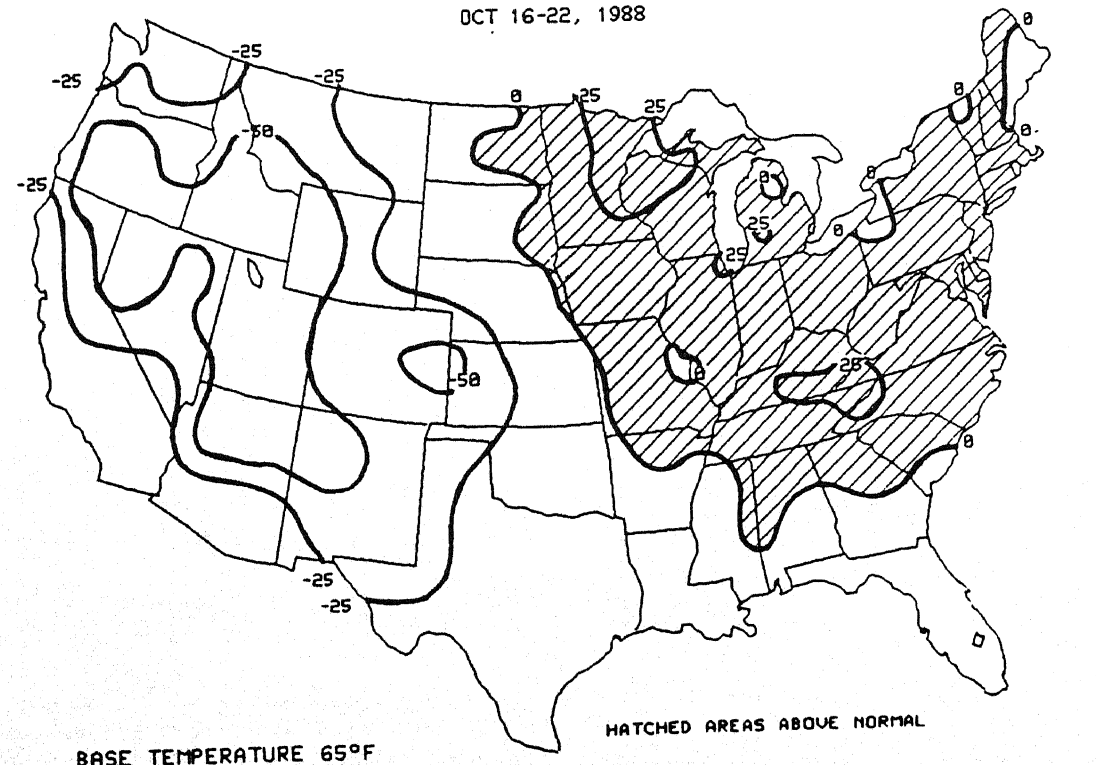


FIGURE 1

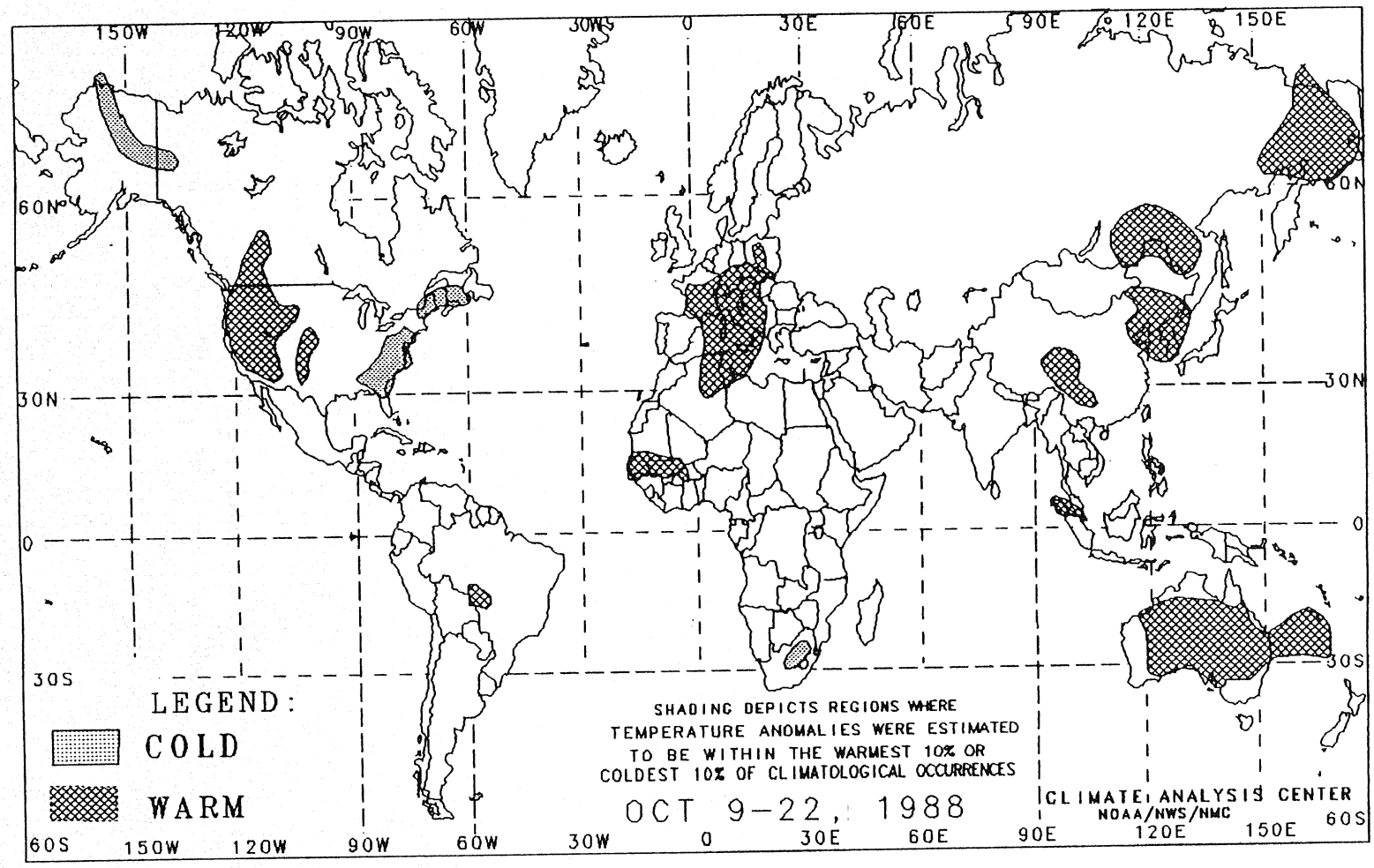


The largest weekly heating usage (>150 HDD) occurred in the northern Great Plains, upper Midwest, and northwestern New England (top). Cold weather increased the weekly heating demand in the Midwest, mid-Atlantic, and New England states while unseasonably warm conditions reduced weekly heating usage in much of the West (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

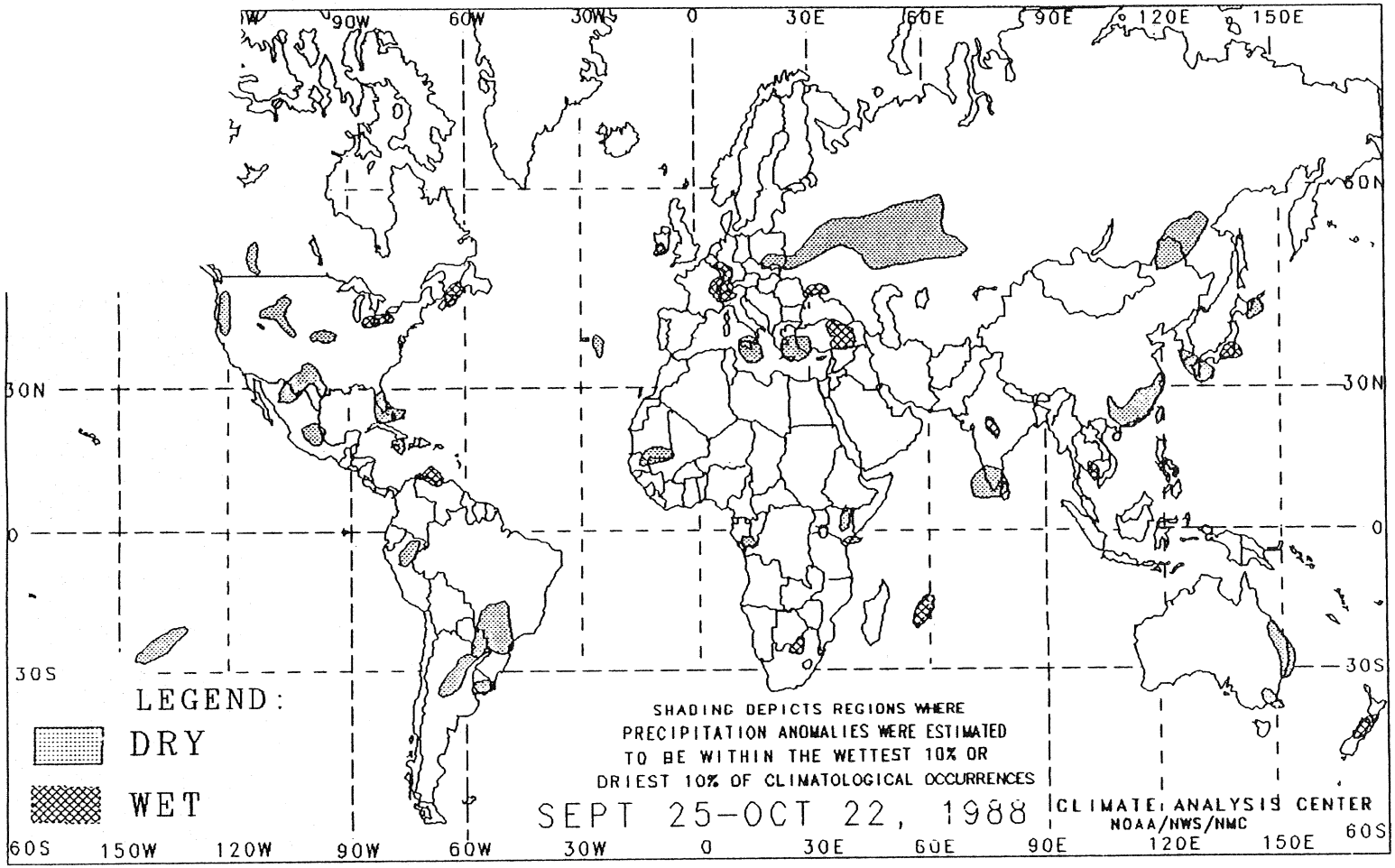
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining precentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

CLIMATE ANALYSIS CENTER, NMC
NATIONAL WEATHER SERVICE, NOAA

NORTHERN ARGENTINA, PARAGUAY, URUGUAY, SOUTHERN BRAZIL, AND SOUTHEASTERN BOLIVIA: DRY CONDITIONS HAVE PERSISTED INTO THE NORMALLY RAINY SPRING SEASON.

The winter months of June, July and August are normally characterized by dry conditions in much of southern Brazil, Paraguay, Uruguay and northern Argentina as represented by the normal monthly precipitation totals for Asuncion, Paraguay (see Figure 1 for normals and Figure 4 for geographical location). During the spring months (September-November), however, rainfall usually increases dramatically throughout most of the area. Since July (April in some areas), precipitation has been anomalously deficient in much of northern Argentina, Uruguay, Paraguay, southeastern Bolivia, and southern Brazil as relatively dry weather has continued into the middle of October.

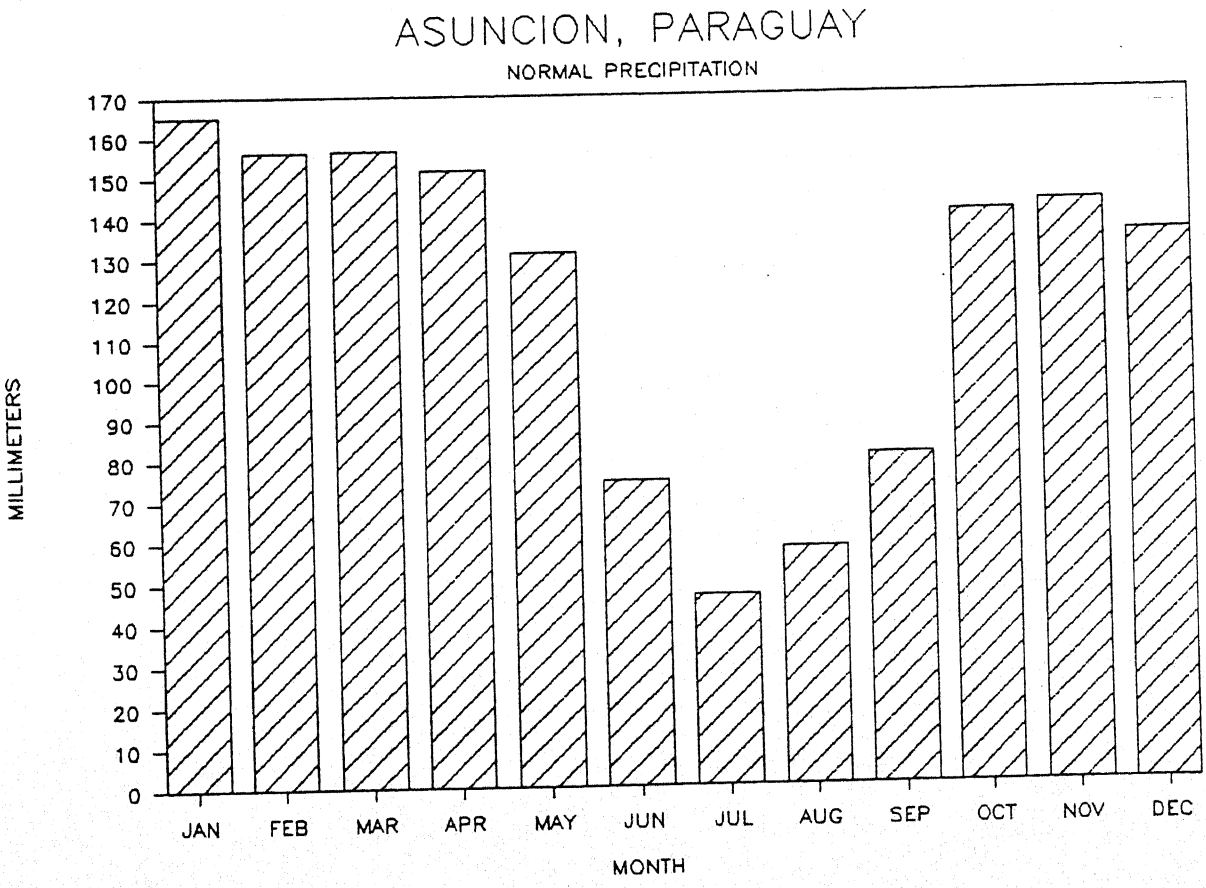


Figure 1. Monthly normal precipitation amounts (mm) for Asuncion, Paraguay. Precipitation normally reaches a minimum during the winter months (Jun-Aug) and peaks during the summer months (Dec-Feb).

Accumulated rainfall amounts since July 1 have ranged from less than 100 mm in the southern Brazilian states of Mato Grosso do Sol, Parana, Santa Catarina, and Sao Paulo, northern Paraguay, southeastern Bolivia, and north-central Argentina, to more than 500 mm in the Brazilian state of Rio Grande do Sol, which experienced abnormally heavy precipitation during the last half of September (see Figure 2). Other areas that recorded excess rainfall for the period were located in the states of Buenos Aires, La Pampa, and Formosa in northeastern, north-central, and extreme northern Argentina, respectively.

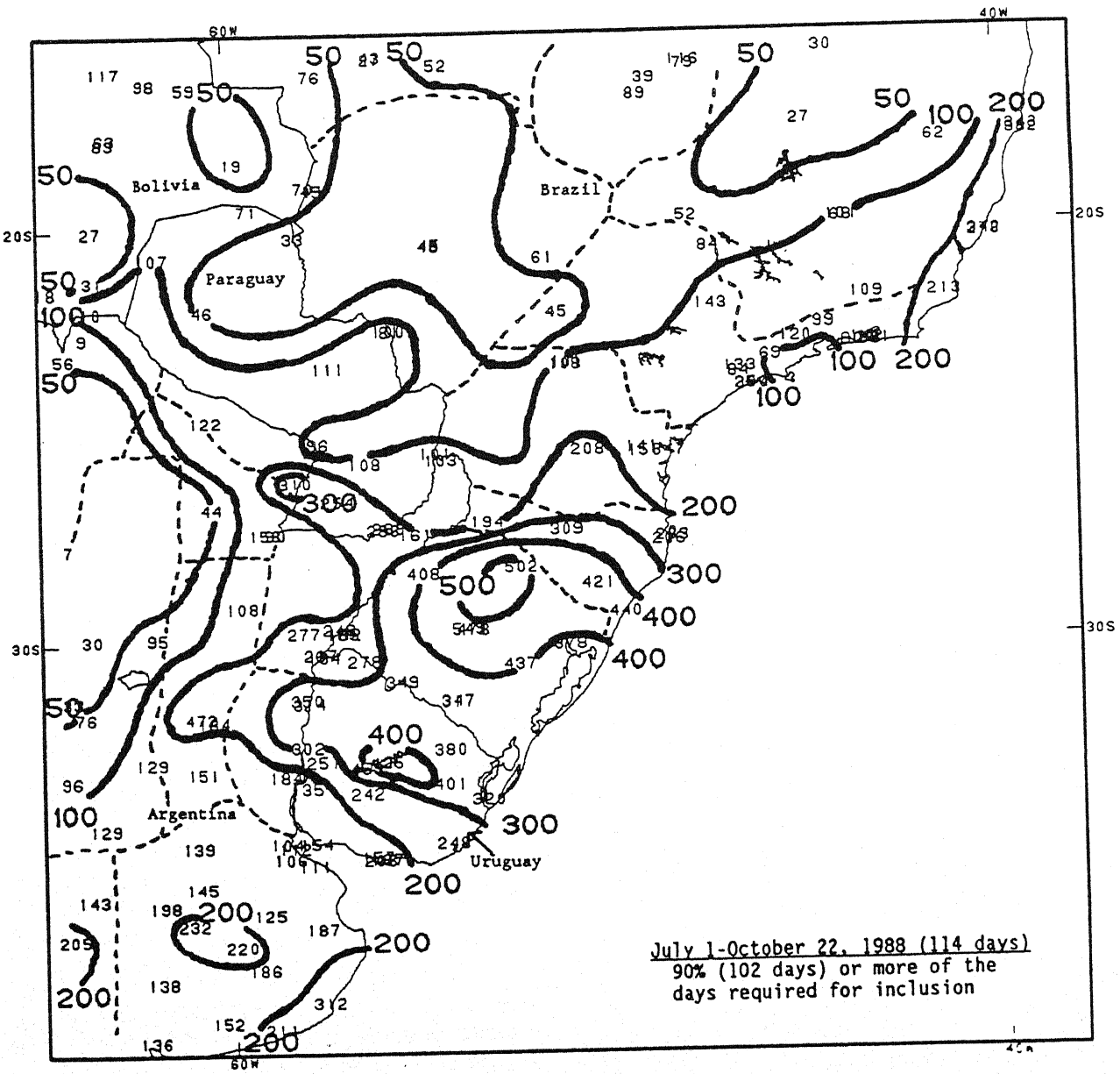


Figure 2. Total precipitation (mm) during July 1-October 22, 1988.

A large section of southern Brazil, Paraguay, southeastern Bolivia, and northern Argentina has totaled less than half the normal precipitation during the past three and one-half months (see Figure 3). Additionally, parts of Mato Grosso do Sol, Parana, and Sao Paulo states in Brazil and northern Paraguay have measured less than 25% of the normal rainfall since July 1. In contrast, only a few small areas of Brazil, Uruguay, and Argentina have observed near to above normal precipitation during the period.

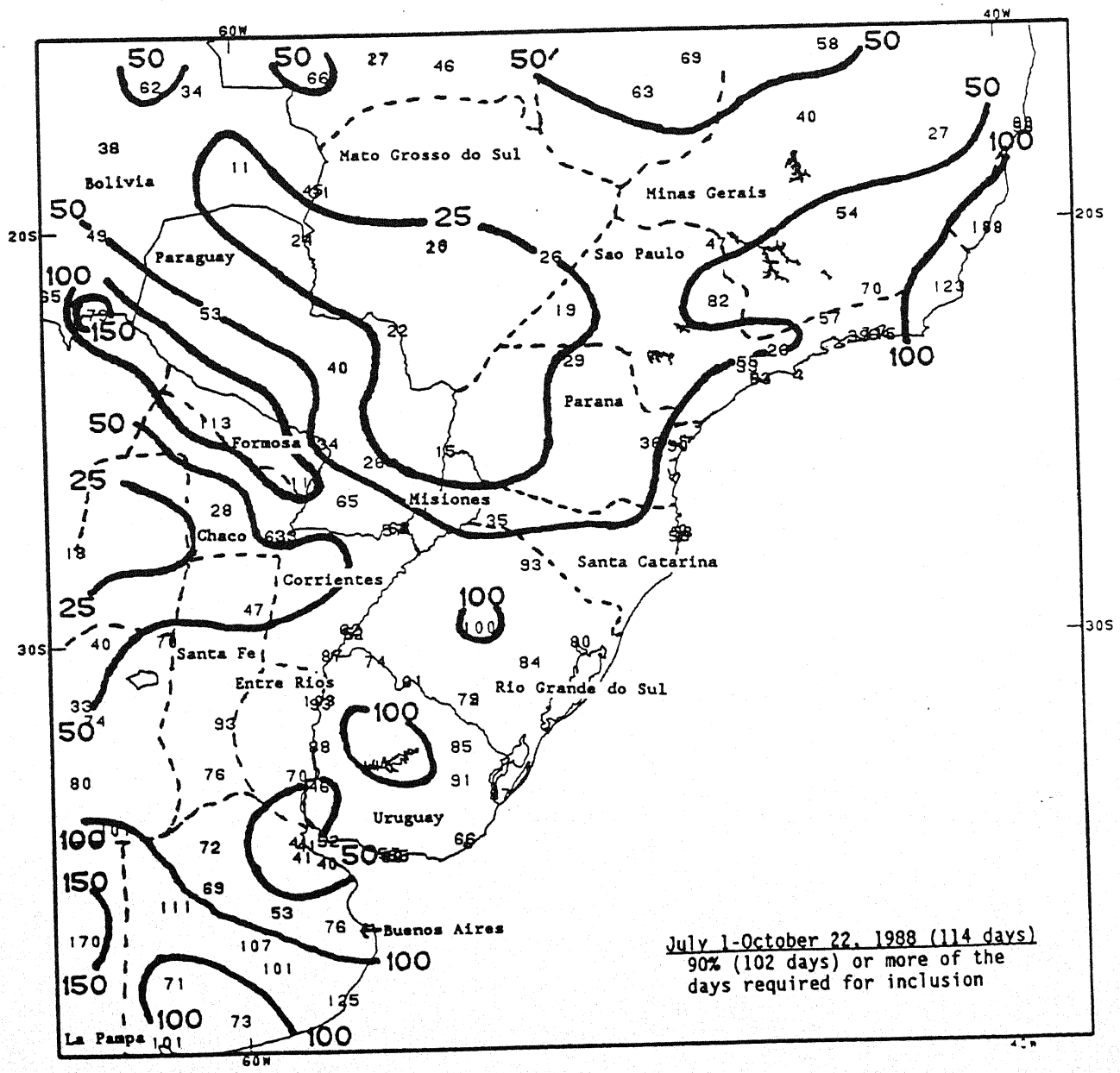


Figure 3. Percent of normal precipitation since July 1, 1988. Much of the area has received less than half the normal rainfall over the past 3 1/2 months.

Precipitation deficits have accumulated to more than 100 mm over a large section of the region, especially in south-central Brazil, eastern Paraguay, and northeastern Argentina (see Figure 4). Deficiencies exceeding 300 mm (up to 560 mm at Foz do Iguacu, Brazil) were located in the Brazilian states of Mato Grosso do Sol and Parana, extreme eastern Paraguay, and the state of Misiones in northeastern Argentina. With the start of the growing season, significant rainfall is urgently needed to reduce both the short and long-term precipitation deficits accumulated since mid-1988.

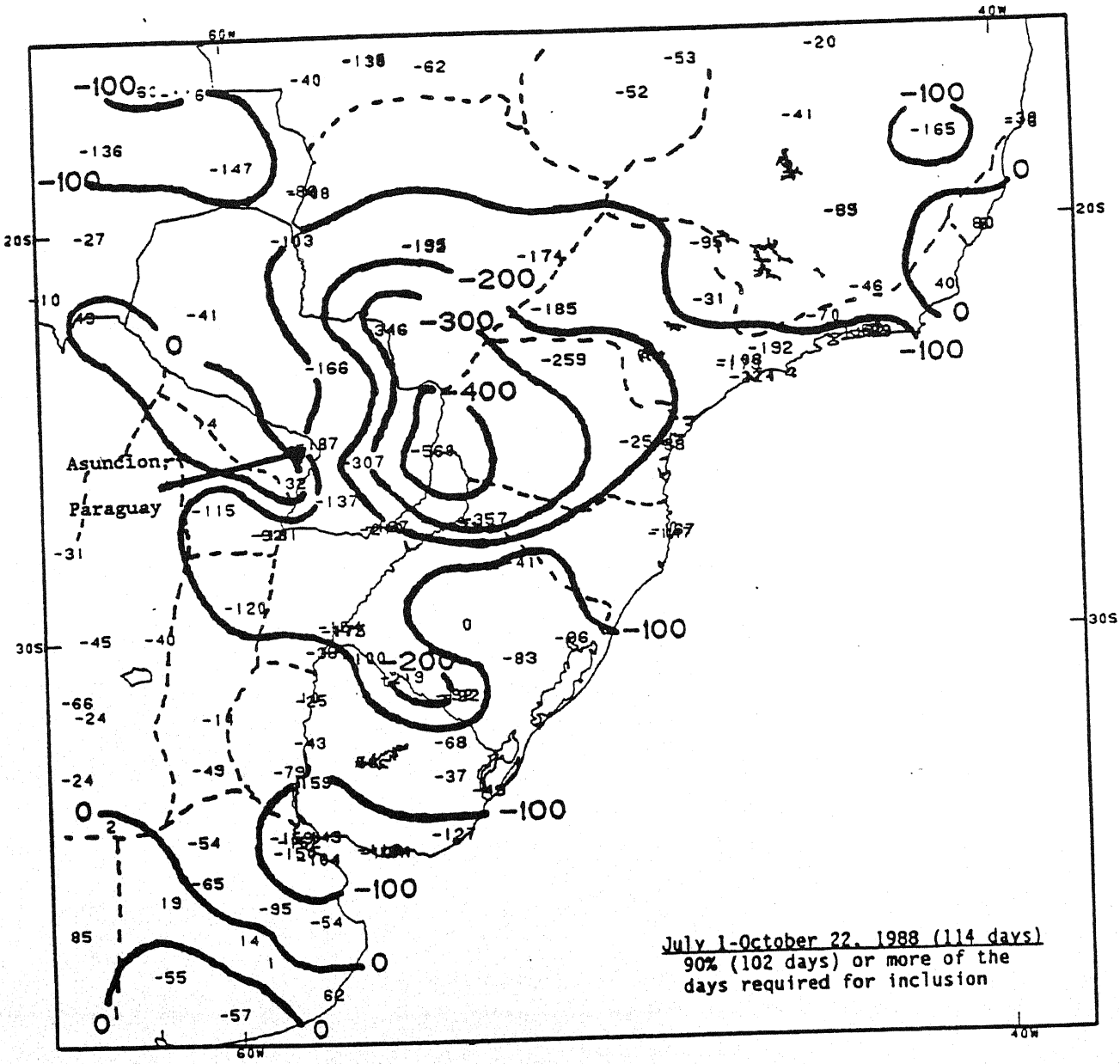


Figure 4. Departure from normal precipitation (mm) during July 1-October 22, 1988. Parts of eastern Paraguay, southern Brazil, and northeastern Argentina have accumulated deficiencies of more than 200 mm.